Geographic Information Systems

WHAT IS THE PUBLIC HEALTH PROBLEM?

- Approximately 40,000 hazardous-waste sites have been reported to the federal government. Additionally, thousands of inadvertent environmental releases of toxins occur each year.
- More than 1,600 hazardous waste sites are included on the National Priorities List (NPL) and are targeted for clean up by the U.S. Environmental Protection Agency. About 15 million people live within 1 mile of NPL sites.
- There is a critical need to correlate the proximity of people to the geographic location of environmental hazards.

WHAT HAS ATSDR ACCOMPLISHED?

A geographic information system (GIS) is a computer-based system that allows the layering of health, demographic, environmental, imagery, and other traditional data sources to be analyzed by their location on the earth's surface. A critical component of a GIS is its capability to conduct complex spatial analyses to assist in public health decision making.

The Agency for Toxic Substances and Disease Registry (ATSDR) uses GIS technology to analyze data on population and topography (including roads, streams, and land elevation) as well as information gathered from residents. These data are used to track the spread of environmental contamination through a community, to identify geographic areas of particular health concern, and to identify susceptible populations (e.g., children, childbearing-aged women, the elderly, and minority populations).

The GIS technology was used extensively in response to the terroristic attacks on the World Trade Center Towers in Manhattan on September 11, 2001. Mapping products included building usage (e.g., schools, residences, and businesses), locations of completed environmental sampling, and daily updates of asbestos sampling to address local health concerns. ATSDR staff members also used GIS technology to plot locations where anthrax was found in anthrax-contaminated buildings.

WHAT ARE THE NEXT STEPS?

ATSDR is expanding the field applications for public health emergency preparedness and response. The Agency is continuing to develop Internet based applications linking public health professionals to large data warehouses for public health research and planning. Through collaborations with other Federal, state, and local agencies, ATSDR is working to build the capacity for use of this tool in public health applications at all levels.

For additional information on this and other CDC and ATSDR programs, visit www.cdc.gov/programs. *February 2003*